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ABSTRACT

A longitudinal study compared the academic abilities of undergraduate women students in seven college programs at a large university. Four questions were posed: (1) What are the academic qualifications of women choosing education as a career? (2) How do these women compare with women choosing other programs? (3) What changes take place in the career choices of women during their college career? and (4) Are women who are unsuccessful in other programs choosing education as a last resort? Information was gathered on women choosing programs in agriculture, business, education, engineering, liberal arts, physical education, and science. The qualifications of the students were measured by Scholastic Aptitude Test averages for the math and verbal components for each of their four years and by their high school class standing. An analysis of the resulting data indicated that education attracts women who have lower academic qualifications than women in other fields. Large numbers of women with high academic ability chose majors in male-dominated fields. The greatest difference between women choosing education as a career and women choosing other areas was in mathematics scores. The wide range in verbal test scores that appeared at the senior year indicated that education was allowing women with marginal verbal skills to complete the program. However, the improved academic qualifications apparent at the junior year indicated that some women with high academic qualifications were evaluating their original career choice and choosing education as a career. By the junior year, women in education compared quite favorably with those in other fields. (JD)

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THE ACADEMIC QUALIFICATIONS OF WOMEN CHOOSING EDUCATION AS A MAJOR

by

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The quality of students choosing education as a major area of study has been the topic of recent concern. Weaver (1979) reported a significant decline in the academic qualifications of students entering the field of education. He concluded that this "education brain drain" posed the most serious threat to the quality of education. Watts (1980) stated that education seemed to attract those with less ability and talent. He reported that a 1976 study revealed that those choosing education scored the lowest of all groups on both the verbal and math sections of the Scholastic Aptitude Test. Watts summarized the concern in his statement that, "Even a superb preparatory program cannot make a competent teacher out of an inadequate candidate. (p. 120)."

As if this situation were not serious enough, Weaver (1979) stated that the weak education students were not screened out prior to graduation. Data from his study revealed that teacher education was the least selective of eight areas studied. Watts (1980) reinforced this concern. He stated that, "apparently many applicants for other professional programs have been rejected or believe they cannot meet the standards of those programs and have selected school teaching as a 'last chance' vocation. (p. 20)."

An unknown variable in this reported decline is the impact the sexual equity movement has had on students choosing education as a career. Until recent years education has been one of the few career fields open to women. However, there has been a great deal of encouragement for women with high academic qualifications who would have entered education in the past to choose other careers.

The purpose of this study was to answer several questions. Those questions were: 1) What are the academic qualifications of women choosing education as a career? 2) How do these women compare with women choosing other programs? 3) What changes take place in the career choices of women during their college career? 4) Are women who are unsuccessful in other programs choosing education as a last resort?

Methods

A longitudinal study of the academic qualifications of women entering a large university was conducted. Descriptive information was gathered on the women choosing programs of study in agriculture, business, education, engineering, liberal arts, physical education and science. In order to account for changes during a college program, this group of women was followed through the sophomore, junior, and senior years. Data were recalculated for each of these years in an effort to determine the qualifications of the women making changes. Due to limitations in data only women who entered the university as freshmen in 1976 were included in the sample. Therefore, the data include only intra-university transfers and not those who may have entered from other universities.

The most common measure used to assess the qualifications of students entering the university is the Scholastic Aptitude Test scores. Often studies report the scores of high school students who state that they plan to enter a teacher preparation program. While such scores might be a useful measure, they do not reflect those who actually do enter teacher preparation program nor reflect changes during the four years of college. For the purposes of this study the composite S.A.T. averages and the averages for the math component and the verbal component were gathered for the group for the four year sequence of time.

It has been suggested that other measures of quality might be more useful. Some contend that one of the most important indicators of college performance is the high school record of the student (Bejar and Blew, 1981). Therefore, in addition to the S.A.T. scores, the high school class standing by quarter was calculated for the women in each of the programs for each of the four years. Those graduating in the top quarter of their high school class were awarded a 1, those in the second quarter a 2, those in the third quarter a 3, and those in the fourth quarter a 4. These were then averaged for all women in each of the seven program areas.

In addition to reporting the S.A.T. averages for each of the four years, the range and distribution of the scores was also investigated. The resulting percentile ranges were reported as another means of characterizing the population. In order to eliminate the possible distortion effects

of extremely high and low scores, the top and bottom ten percentiles were omitted. This allowed for the comparison of 80 percent of the women in each area of study. These percentile ranges were reported for the math and verbal components of the S.A.T. so that specific differences in the population could be noted.

The Department of Educational Curriculum and Instruction (EDCI) at the university is the department within the College of Education with primary responsibility for the preparation of teachers. Therefore the data for the women in that program area were used rather than for the College of Education in general. It should be kept in mind that the majority of the women in EDCI are those choosing elementary education as a career. Many of those choosing secondary education have majors in other academic areas. There is some indication that those choosing secondary education have somewhat higher S.A.T. scores than those choosing elementary education. It might be hypothesized that the distribution would be slightly higher for those choosing secondary education.

Analysis of Data

Number of women choosing various majors. The number of women in each of the seven areas were gathered. Table I displays these data. At the freshman level education was next to last in terms of the total number of women choosing the field. This would seem to indicate that a great number of women are choosing other areas of study.

(Insert Table I here)

At the sophomore year, there was a significant drop in the total number of women in all of the areas studied. This is probably normal attrition that should be expected.

It is interesting to note the shifts that occurred at the junior year. Some major shifts took place. Business, agriculture, education and physical education all experienced some growth. Science and liberal arts experienced rather sharp declines. Science dropped by a total of 238 women. Liberal arts declined a total of 93. One would expect that these shifts reflect students who have decided to stay in the university and who are clarifying their career choices.

There is a decrease of women in all fields at the senior year. Once again the declines are greatest in science and liberal arts. Some of this decline might be due to students who are proceeding at a slower than normal

rate, who do not graduate in four years, and who, therefore, are not classified as seniors.

A comparison of the numbers of students entering EDCI as freshmen and the number graduating as seniors could lead to some erroneous conclusions unless the intervening changes were noted. One might conclude that few students are screened out or leave education since there is only a net change of fifteen students between the freshmen and senior years. However, the changes at the sophomore and junior year would seem to indicate that a relatively high percentage did drop out and that they were replaced by transfers from other programs.

Scholastic Aptitude Test Scores

The composite S.A.T. averages are reported in Table II. Using the composite score as a criterion measure, the EDCI majors do not compare very favorably with students in other programs. They rank sixth of the seven areas with only physical education having a lower average.

(Insert Table II here)

There is an increase in the S.A.T. averages with each year. Science and liberal arts had the largest increase with increases of 49 and 28 points. It is important to remember that these two fields also experienced the greatest attrition. While one might conclude that these two areas are being more selective, it is apparent that they are also losing numbers of highly qualified women. Agriculture has the smallest gain with a net increase of 7 points. EDCI had a net gain of 14 points. This compares quite favorably with a 15 point increase in business and a 13 point increase in physical education.

It is especially interesting to note that at the junior level, when EDCI experiences an increase of 31 students (26%), the S.A.T. composite scores increased 15 points. This indicates that those who transferred into EDCI were those with higher S.A.T. scores than those already in the program. Using this figure as an index, one could conclude that EDCI received some relatively high quality students from other program areas. This would seem to contradict the notion that students who do not meet the standards of other programs are choosing education as a last resort.

In order to test this conclusion, the grade point average for EDCI was compared for the sophomore and junior years. If the students were transferring from other programs because of lack of success, the grade point average would be expected to show a decrease. However, the opposite was the case. The grade point average at the sophomore year for women in EDCI was 2.67. At the junior year the grade point average for all EDCI women was 2.85.

It might be concluded that the women changing to EDCI during the junior year were not doing so because of failure but rather because of interest.

An analysis of the S.A.T. subscores (Table III) indicates that the greatest difference between women in EDCI and those in other areas was in math. There was a 106 point difference between the EDCI average and the average for the women choosing engineering. All programs showed an increase in math scores by the senior year. Science and engineering showed increases of 20 and 19 points. The increase for EDCI was 7 points. Business and agriculture also had seven point increases while liberal arts had a six point increase. Given the nature of the various majors and the demand for women with math competence, this difference between EDCI and other areas should not be suprising.

(Insert Table III here)

The difference between programs in the verbal averages is not as dramatic. However, EDCI was still in sixth place. There was a 75 point difference between EDCI and engineering at the freshman level. Science and liberal arts had increases of 31 and 22 points by the senior year. The increases of 7 points for EDCI was comparable to the increases of 8 points for engineering and business and ahead of the gains of 2 points in physical education and 1 point in agriculture.

Percentile Ranges

In order to provide additional information regarding the characteristics of the populations, the percentile ranges for each of the seven programs were calculated. The top ten percent and the bottom ten percent of the distributions were dropped in order to eliminate the effects of unusually high or low scores. It was believed that this would give a good profile

of the students in each program area.

Table IV shows the S.A.T. math percentile ranges for women students in EDCI. There is a steady upward trend in the distribution with each year. At the senior year there is a narrow range of 20 points between the 10th and 25th percentiles. This would indicate a clustering of students at that end of the distribution. On the other hand, there is a range of 55 points between the 75th and 90th percentiles. Given the fact the the 50th percentile changes very little during the four years, it might be concluded that the students leaving EDCI were near the bottom of the distribution, while those entering were generally clustered about the mid-point.

(Insert Table IV here)

The distribution of the verbal scores for women in EDCI is displayed in Table V. This distribution is quite different than the math distribution. The math distribution had a slight narrowing of the range between the freshman and senior years. However, the verbal range had an increase of 57 points between the freshman and senior years. Most of this increase, (45 points) is at the upper end of the distribution. However, there is actually a drop in the 10th percentile of 12 points. This would seem to indicate that those students who are transferring into EDCI tend to be those who are strong in the verbal area. However, there seems to be less selectivity in EDCI in this area and more students with lower scores are allowed to enter and complete the program.

(Insert Table V here)

A comparison of the percentile ranges in math for freshman women in the seven areas studied is found in Table VI. The range for EDCI is narrower than any of the other areas. The distribution for EDCI is quite similar to the distributions for physical education and liberal arts. The women choosing engineering and science are clearly superior in math ability at the freshman level. Those scoring at the 50th percentile in EDCI would only be at the 10th percentile in engineering.

(Insert Table VI here)

Table VII shows the distribution of math scores for the various areas at the senior level. The distribution of math scores relative to most of the other areas was somewhat improved. Actually, EDCI compared quite favorably with all areas except engineering and science. It could be concluded that the top 75% of women in EDCI at the senior level could

successfully compete with the women in all areas except for science and engineering.

(Insert Table VII here)

A comparison of the distribution of verbal scores at the freshman level is shown in Table VIII. EDCI compares somewhat favorably with all other areas. Once again it might be concluded that the upper 75 percent of the freshmen women in EDCI could favorably compete with the women in any of the seven areas studied.

(Insert Table VIII here)

However, at the senior level the situation is somewhat changed (Table IX). While there is some improvement at the upper end of the distribution relative to other areas of study, the situation is worse at the lower end of the distribution. The 25th percentile for EDCI is below the 10th percentile for all areas except agriculture and physical education. Only about the top 60 percent of the EDCI students would be predicted to compete successfully with women in other areas.

(Insert Table IX here)

High School Ranking by Quarter

Another criterion measure that has been considered important is high school class standing. This criterion may provide a better indication of study habits and seriousness of purposes than the S.A.T. scores. Therefore the high school standing by quarter of women choosing the seven areas of study was calculated. As stated earlier, those who graduated in the top quarter of their high school class were given a rating of 1, those in the second quarter a 2, those in the third quarter a 3, and those in the fourth quarter a 4. Therefore, an average of 1 would indicate that all students were in the top quarter of their high school class. The rankings of the seven areas of study according to the class standings of the students are reported in Table X.

(Insert Table X here)

At the freshman level engineering was at the top of the list with a 1.10

average. EDCI was tied with liberal arts in last place with an average of 1.30.

At the junior level the average for EDCI improved to a 1.19 average. This was almost twice the increase of any other area. This placed EDCI ahead of physical education and liberal arts and compared quite favorably with agriculture which had a 1.17 average.

These data continue to support the conclusion that those students transferring into EDCI from other programs are of a relatively high quality. They could possibly indicate that some selection factors were operating which eliminated those students who graduated in the lower quarters of their high school class. One possible explanation could be the nature of EDCI courses. The course requirements might not reward those who are strong in the math or verbal dimensions measured by the S.A.T. Rather, the course requirements focus on task commitment and task persistence, traits that would tend to be reflected by high school standing.

Discussion

The bad news seems to be that education is attracting women who have lower academic qualifications than other fields. A tentative conclusion might be that the sex equity movement is having an impact on women entering college. Large numbers of women with high academic qualifications are choosing majors in male-dominated fields. The day when education could automatically expect to attract high quality women would seem to be over.

The greatest difference between those women choosing education as a career and those in other areas is in the math area. This fact should not be surprising given the job opportunities available for those who do have math proficiency.

The women choosing education as a career are more competitive in the verbal area. However, it would appear in this one instance, that education is not being as selective in the verbal area. The wide range that appears at the senior level would seem to indicate that education was allowing women with marginal verbal skills to complete the program. This may indicate a need for improved standards of admission in the verbal area.

However, the news would not seem to be entirely negative. The shifts

in majors and the resulting improvement of the academic qualifications at the junior level for EDCI majors would seem to indicate that some relatively high quality women are evaluating their original career choice and are choosing education as a career. This finding does not support the contention that women are choosing education as a career because of failure in other programs.

By the junior year the women in education compared quite favorably with the women in physical education, liberal arts, and business. With the exception of engineering, there did not appear to be a major difference between the majority of the women in EDCI and the women in other programs.

Several limitations should be kept in mind when interpreting these data. The data reflect only one group of women at one university. Unique circumstances may have influenced the distribution so that it may not be typical of other classes. However, an in-progress follow up study lends tentative support to the conclusions.

This sample was taken from a university that has admission standards as well as strong programs in engineering, agriculture, and science. This would no doubt have an influence on the type of women who would choose this university. Whether or not this pattern could be generalized to other types of colleges and universities is questionable.

Finally, the academic qualifications of women transferring from other universities and two-year colleges are not included. Since transfer students comprise a substantial population in many universities, it is important to gather data on that population before arriving at any conclusions regarding the qualifications of the population of women who ultimately enter the classroom.

TABLE I

Number of Women Choosing Selected Majors

Freshmen	Sophomore	Junior	Senior
1. Science 413	1. Science 346	1. Bus. 311	1. Bus. 291
2. Lib. Arts 379	2. Lib. Arts 297	2. Agri. 262	2. Agri. 232
3. Business 289	3. Bus. 248	3. Lib. Arts 204	3. Lib. Arts 161
4. Agri. 238	4. Agri. 209		4. Engn. 149
5. Engn. 225	5. Engn. 194	5. Engn. 168	5. EDCI 136
6. EDCI 151	6. EDCI 116	6. EDCI 147	
7. P.E. 39	7. P.E. 38	7. Science 108	7. Science 67
		8. P.E. 55	8. P.E. 45

TABLE II

Mean SAT Scores of Women
Choosing Selected Areas of Study

Freshmen	Sophomore	Junior	Senior
1. ENGN 1126	1. ENGN 1133	1. ENGN 1150	1. ENGN 1152
2. Science 1055	2. Science 1048	2. Science 1103	2. Science 1104
3. Business 1015	3. Agri. 1016	3. Bus. 1033	3. Bus. 1030
4. Agri. 1015	4. Bus. 1016	4. Agri. 1025	4. Lib. Arts 1029
5. Lib. Arts 1001	5. Lib. Arts 1006	5. Lib. Arts 1019	5. Agri. 1022
6. EDCI 944	6. EDCI 951	6. EDCI 966	6. EDCI 958
7. P.E. 926	7. P.E. 928	7. P.E. 936	7. P.E. 939

TABLE III

SATM -- Means

Freshmen	Sophomore	Junior	Senior
1. ENGN 595	1. ENGN 600	1. ENGN 612	1. ENGN 614
2. Science 545	2. Science 541	2. Science 565	2. Science 565
3. Bus. 531	3. Bus. 533	3. Bus. 541	3. Bus. 538
4. Agri. 516	4. Agri. 523	4. Agri. 523	4. Agri. 523
5. Lib. Arts 499	5. Lib. Arts 502	5. Lib. Arts 500	5. Lib. Arts 505
6. EDCI 489	6. EDCI 492	6. EDCI 499	6. EDCI 496
7. P.E. 480	7. P.E. 480	7. P.E. 488	7. P.E. 491

SATV -- Means

Freshmen	Sophomore	Junior	Senior
1. ENGN 531	1. ENGN 532	1. ENGN 537	1. Science 539
2. Science 507	2. Science 509	2. Science 533	2. ENGN 538
3. Lib. Arts 502	3. Lib. Arts 504	3. Lib. Arts 519	3. Lib. Arts 524
4. Agri. 498	4. Agri. 502	4. Agri. 502	4. Agri. 499
5. Bus. 483	5. Bus. 483	5. Bus. 492	5. Bus. 491
6. EDCI 456	6. EDCI 458	6. EDCI 467	6. EDCI 463
7. P.E. 446	7. P.E. 448	7. P.E. 448	7. P.E. 448

TABLE IV
SAT Math
EDCI

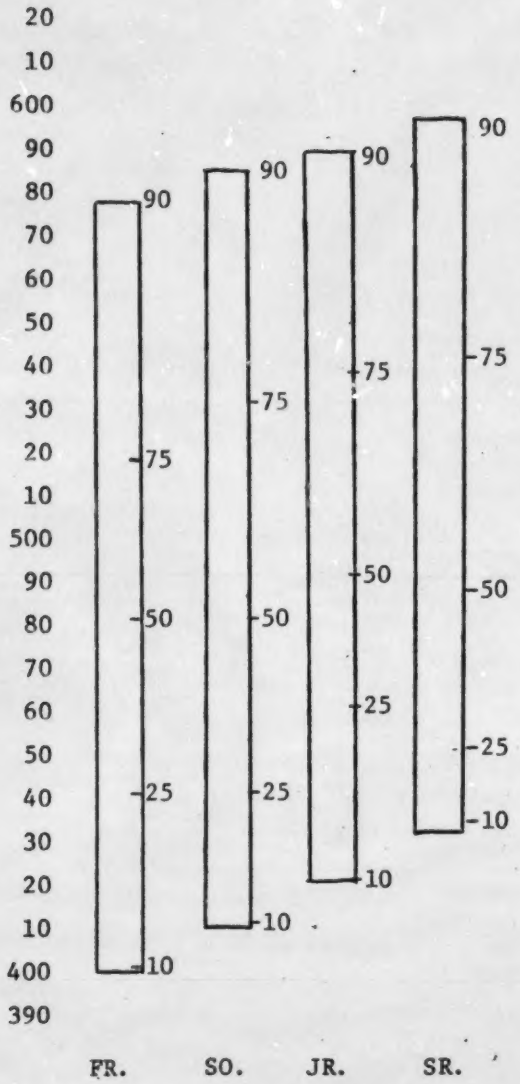

TABLE V
SAT Verbal
EDCI

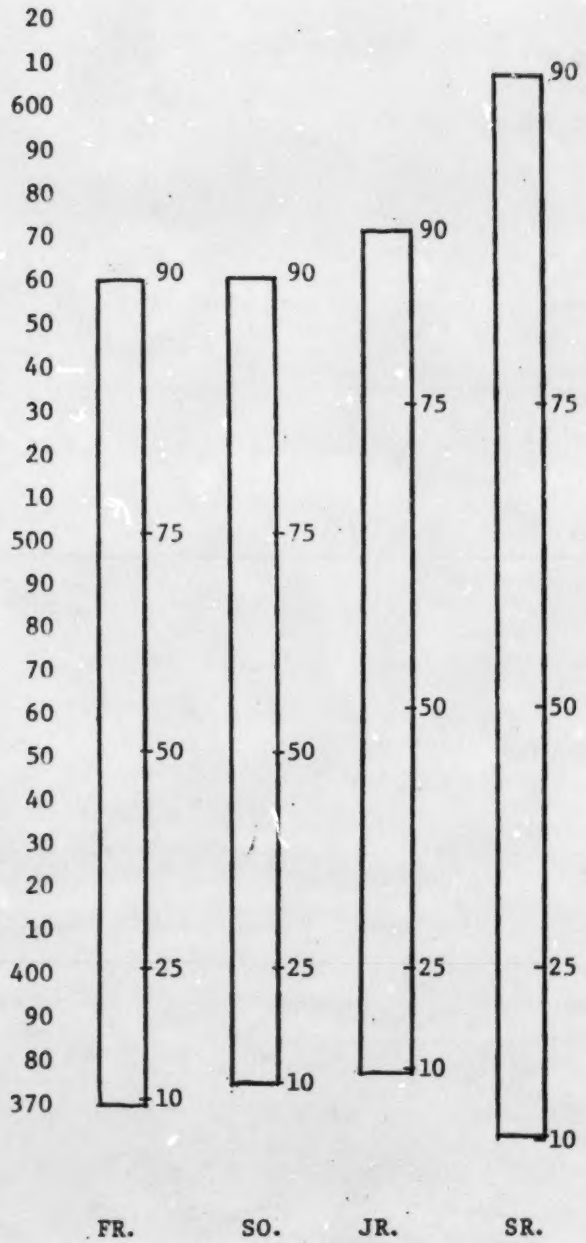

TABLE VI
Freshmen - Women
SAT Math

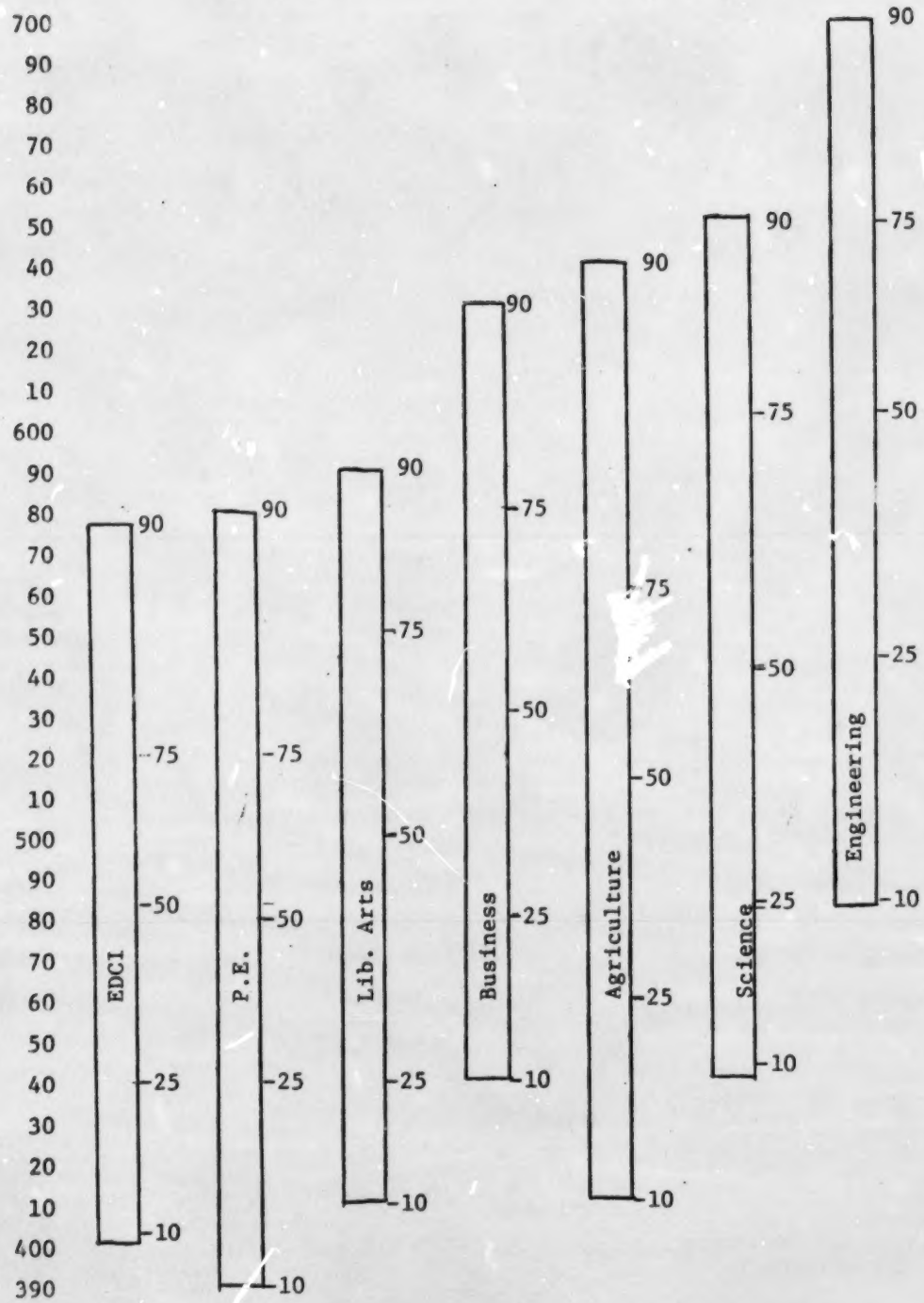

TABLE VII
SR - Women
SAT Math

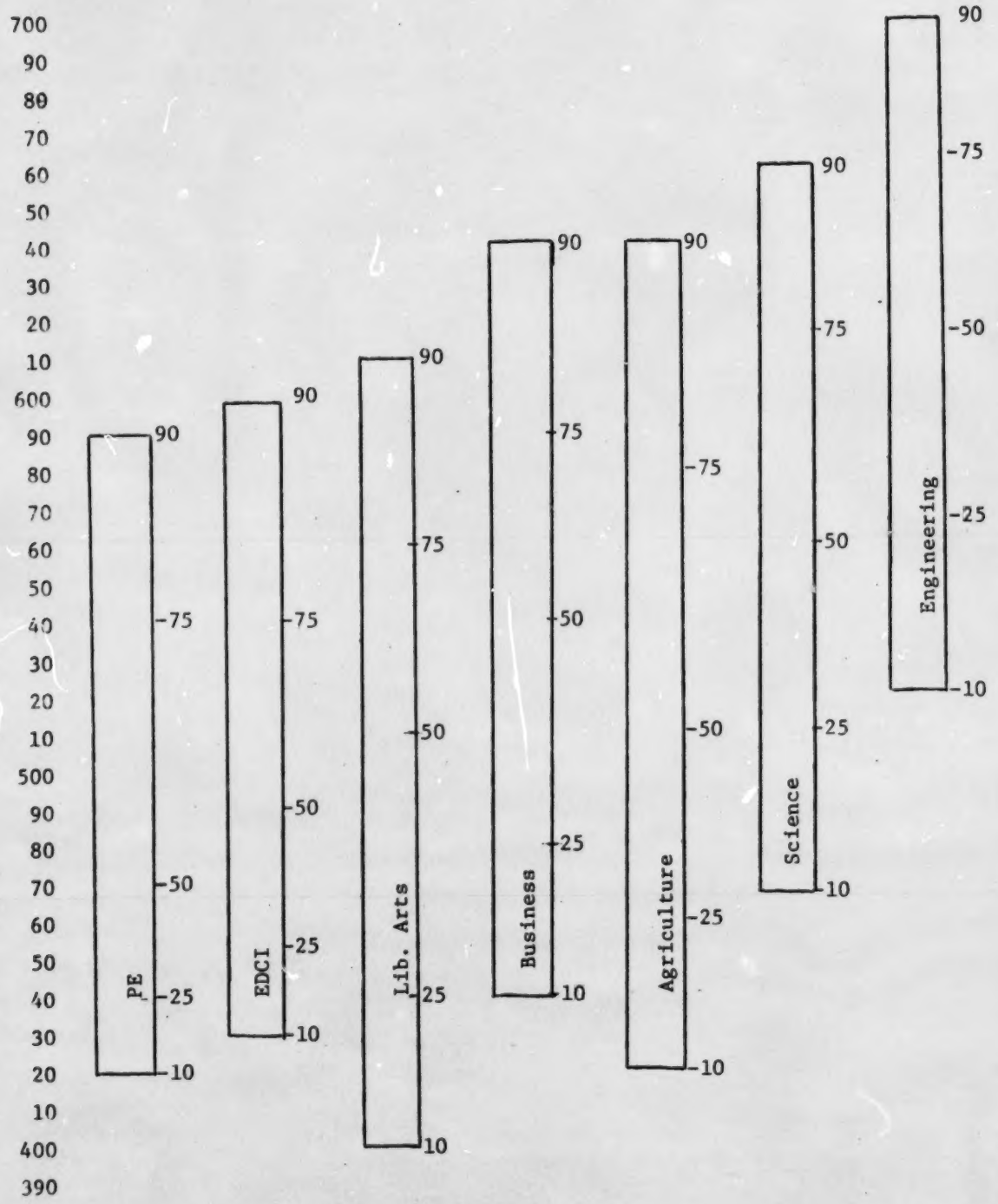

TABLE VIII
Freshmen - Women
SAT Verbal
1976

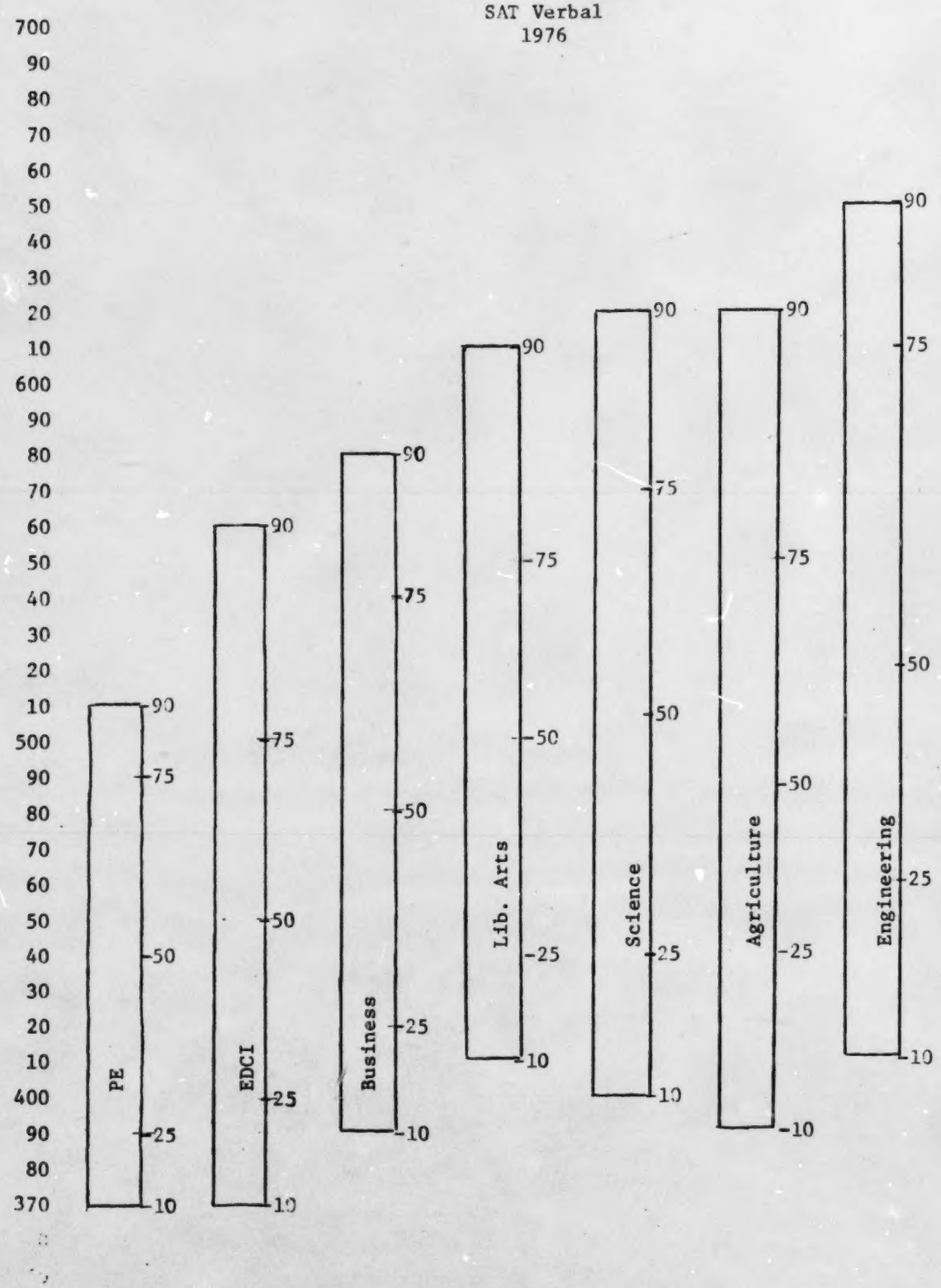

TABLE IX
SR - Women
SAT Verbal

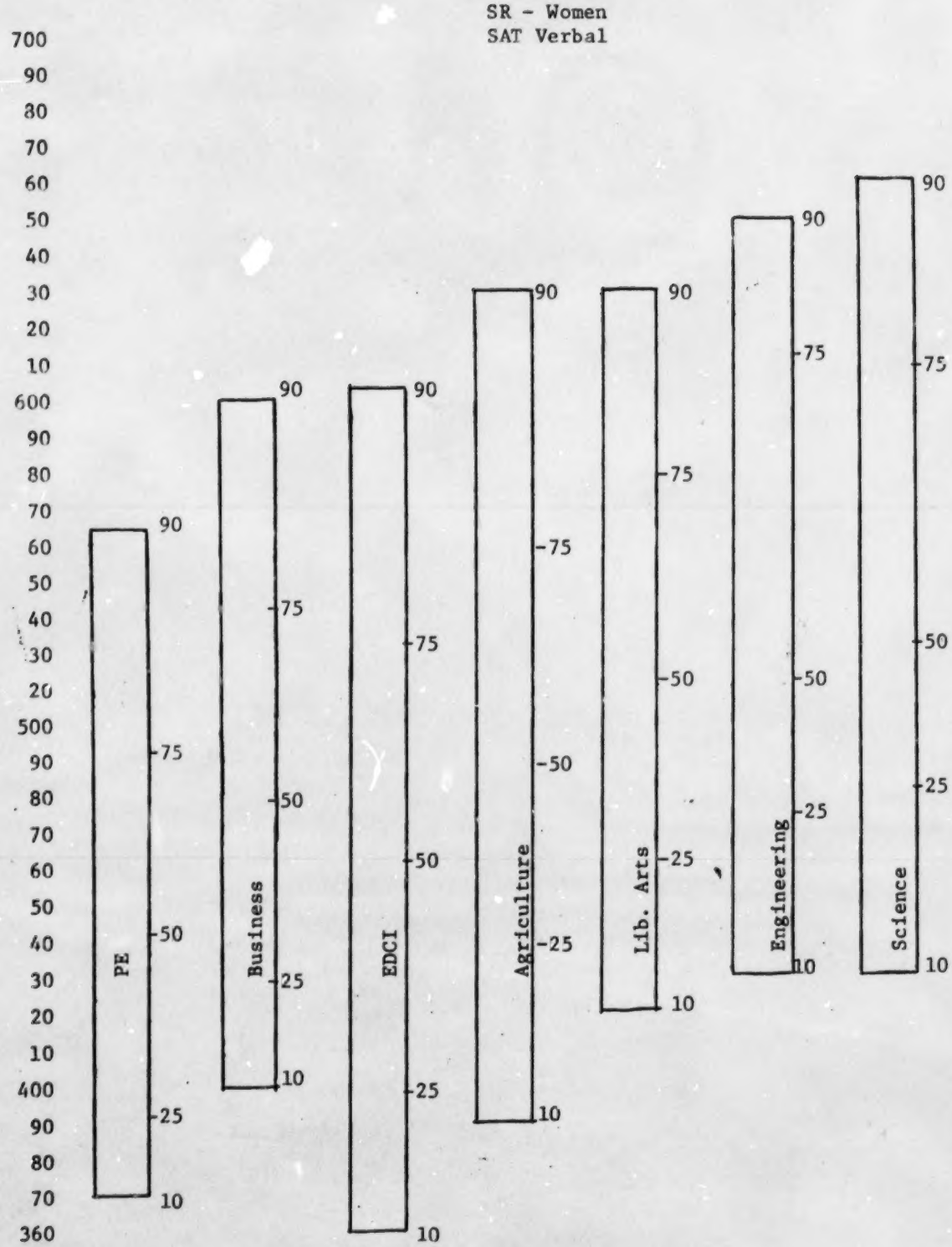

TABLE X

High School Ranking by Quarter

Freshmen	Sophomore	Junior	Senior
Engn. 1.10	Engn. 1.08	Engn. 1.05	Engn. 1.04
Bus. 1.12	Bus. 1.11	Bus. 1.13	Bus. 1.13
Science 1.17	Science 1.13	Science 1.13	Science 1.14
Agri. 1.23	Agri. 1.22	Agri. 1.17	Agri. 1.17
P.E. 1.25	P.E. 1.26	EDCI 1.19	EDCI 1.19
EDCI 1.30	EDCI 1.30	P.E. 1.29	P.E. 1.26
Lib. Arts 1.30	Lib. Arts 1.30	Lib. Arts 1.31	Lib. Arts 1.29

1 = First Quarter
2 = Second Quarter
3 = Third Quarter
4 = Fourth Quarter

References

Bejar, I.I. and Blew, E.O. "Grade Inflation and the Validity of the Scholastic Aptitude Test." American Educational Research Journal. 1981, 18, 143-156.

Watts, D. "Admission Standards for Teacher Preparation Programs: Time for a Change." Phi Delta Kappan. 1980, 62, 120-122.

Weaver, W.T. "In Search of Quality: The Need for Talent in Teaching." Phi Delta Kappan. 1979, 61, 29-32, 46.